



Foam Optics And Mechanics (FOAM)



Glenn Research Center

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ESA PIs: Langevin, Saint-Jalmes, Adler (France); Vanderwalle (Belgium);
Waier (Ireland); Odenbach, Barnhardt (Germany); Kronberg (Sweden)

Hardware Development/Engineering: ESA, Major contractor EADS

Science Objectives:

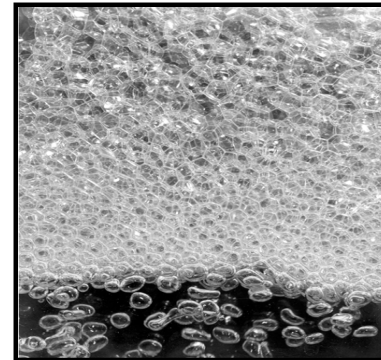
- ◆ To exploit microgravity conditions to quantify and elucidate the unusual elastic character of foam structure and dynamics.
- ◆ To observe how the foam melts into a simple viscous liquid as a function of both increasing liquid content and shear strain rate.

Relevance/Impact:

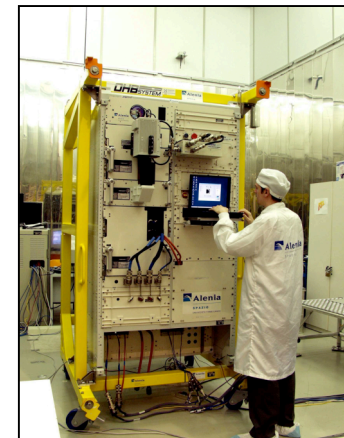
- ◆ The proposed flight research generate valuable fundamental guidance for the development of materials with more desirable rheology and better stability.
- ◆ On board Rheometry and light scattering techniques will provide the rheology and coarsening in terms of microscopic structure and dynamics.

Development Approach:

- ◆ The FOAM flight project is being divided into two major payloads.
 - 1) FOAM Stability will be launched in May 2009 (Increment 19).
 - 2) FOAM Coarsening is still pending.
- ◆ ESA is developing both experiments. US P.I. is funded by NASA.



Wet Foam and Drainage



ESA Fluids Science Lab

ISS Resource Requirements

Accommodation Carrier	FSL Fluids Science Laboratory Progress/Soyuz
Upmass (kg) (w/o packing factor)	50
Volume (m³) (w/o packing factor)	
Power (kw) (peak)	
Crew Time (hrs) (installation/operations)	4 Hrs min. for FOAM Stability TBD for FOAM Coarsening

Project Life Cycle Schedule

Milestones	PRR	SRR	PDR	CDR	FHA	Launch	Ops	Return	Final Report
Actual/ Baseline			July 2007	Sept 2008	L- 6 mos.	May 2009	2009	2009	2010
Documentation	Website: eRoom:			SRD: EDMP:		Project Plan: SEMP:			